of the density from the additivity is insignificant since the initial solutions have almost the same density.It was made absolutely clear by the refractometric method that molecular compounds exist in the ternary systems analyzed. There are 3 figures, 1 table , and 5 references, which are Soviet.

SUBMITTED: July 17, 1957

Card2/2

YERMOLENKO, N.F. [IArmolenka, M.F.]; DEYCH, A.Ya. [Deich, A.IA];
LEVITMAN, Kh.Ya. [Levitman, Kh.IA]

Molecular compounds in ternary and binary mixtures based on refraction and density factors. Vestsi AN BSSR. Ser. fiz.-tekh. nav. no.1:25-29 '59. (MIRA 12:6)
(Systems (Chemical))

SOV/78-4-5-41/46

5(4)

AUTHORS: Deych, A. Ya., Nasonov, V. S.

TITLE: Physico-chemical Analysis of the System $CoCl_2$-$CO(NH_2)_2$-H_2O (Fiziko-khimicheskiy analiz sistemy $CoCl_2$-$CO(NH_2)_2$-H_2O)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 5, pp 1198-1201 (USSR)

ABSTRACT: In the system $CoCl_2$-$CO(NH_2)_2$-H_2O the optical density, surface tension, viscosity, and density were investigated. The initial solutions of $CoCl_2$ and $CO(NH_2)_2$ were produced from chemically pure preparations with concentrations of 1.5 g-mol. Table 1 shows the results obtained by investigating optical density, surface tension, viscosity, and density. Figure 1 shows the optical density of the system $CoCl_2$-$CO(NH_2)_2$-H_2O, which was determined by means of a green filter. Figure 2 shows the density (1), the deviation of density from additivity (2), viscosity (3), the deviation of the logarithm of viscosity from additivity (4), and the surface tension (5) of the system $CoCl_2$-$CO(NH_2)_2$-H_2O. The microphotograph of the crystals, the initial solution, and the mixture with the

Card 1/2

Physico-chemical Analysis of the System $CoCl_2$-$CO(NH_2)_2$-H_2O

molar ratio of components 1:1 were investigated. From the deviation from the additivity of density and the logarithm of viscosity it follows that the compound $CoCl_2 . CO(NH_2)_2$ forms in this system. The microphotograph of the crystals confirms the existence of this compound. There are 3 figures, 1 table, and 7 Soviet references.

SUBMITTED: February 20, 1958

DEYCH, A.Ya.

Formation of compounds of higher order in the system $CaCr_2O_7 - K_2Cr_2O_7 - H_2O$. Zhur.neorg.khim. 5 no.2:503-505 F '60. (MIRA 13:6)
(Calcium dichromate) (Potassium dichromate)

S/078/60/005/009/038/040/XX
B017/B058

AUTHOR: Deych, A. Ya.

TITLE: Study of the Systems $MnCl_2$ - LiCl - CH_3OH and $ZnCl_2$ - LiCl - CH_3OH by Means of Physico-chemical Analysis Methods

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol. 5, No. 9, pp. 2111 - 2114

TEXT: The systems $MnCl_2$ - LiCl - CH_3OH and $ZnCl_2$ - LiCl - CH_3OH were studied by means of physico-chemical analysis methods. The systems were investigated at 20°C with regard to their viscosity, density, surface tension and optical density. The results are mentioned in Tables 1 and 2 and graphically represented in Figs. 1 and 2. In the system $MnCl_2$ - LiCl - CH_3OH, a hardly noticeable interaction of the components was established, especially by determining the optical density. An easily dissociable molecular bond of the composition $Li[ZnCl_3]$ was determined in the system

Card 1/2

Study of the Systems $MnCl_2$ - LiCl - CH_3OH and $ZnCl_2$ - LiCl - CH_3OH by Means of Physico-chemical Analysis Methods

S/078/60/005/009/038/040/XX
B017/B058

$ZnCl_2$ - LiCl - CH_3OH. In methanol, $ZnCl_2$ has a sharper tendency to form complex anions than $MnCl_2$. The author mentions S. M. Dubrovskiy. There are 2 figures, 2 tables, and 14 references: 12 Soviet, 1 US, and 1 German.

SUBMITTED: June 30, 1959

Card 2/2

18.7400, 5.2200

78238
SOV/80-33-3-39/47

AUTHOR: Deych, A. Ya.

TITLE: Brief Communications. Physico-Chemical Investigation of the Possibility of Formation of Complexes in the System $Zr(SO_4)_2$ - $CS(NH_2)_2$ - H_2O

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol 33, Nr 3, pp 732-734 (USSR)

ABSTRACT: In view of the contradictory opinions concerning the feasibility of electrodepositing zirconium in aqueous solutions of its sulfate, the authors investigated the system $Zr(SO_4)_2$-$CS(NH_2)_2$ - H_2O in order to ascertain whether $Zr(SO_4)_2$ reacts with thiourea similarly to $NiSO_4$ (this journal, 1959, Vol 32, p 1872), forming readily dissociable complexes. According to the data obtained with regard to viscosity, density, and surface tension

Card 1/2

Brief Communications. Physico-Chemical Investigation of the Possibility of Formation of Complexes in the System $Zr(SO_4)_2$ - $CS(NH_2)_2$ - H_2O

78238
SOV/80-33-3-39/47

of the aqueous solution of zirconium sulfate and thiourea, no molecular compounds were formed. Hence, the addition of thiourea to the electrolyte will not produce any desirable effect on the quality of the zirconium deposit. There is 1 table; 1 figure; and 7 Soviet references.

SUBMITTED: September 19, 1959

Card 2/2

DLYCH, A.Ya.

More about the study of liquid systems by means of the deviation of viscosity logarithms from additivity. Zhur. fiz.khim. 34 no.6:1382-1383 Je '60. (MIRA 13:7)
(Viscosity) (Systems (Chemistry))

YERMOLENKO, N.F.; DEYCH, A.Ya.

Studying the system $CuSO_4$ - NH_2CH_2COOH - H_2O by physicochemical analysis. Dokl.AN BSSR 5 no.5:215-217 My '61. (MIRA 14:5)

1. Institut obshchey i neorganicheskoy khimii AN BSSR.
(Copper sulfate) (Glycine)

S/078/61/006/002/011/017
B017/B054

AUTHOR: Deych, A. Ya.

TITLE: Physicochemical Study of the Reaction of $Zr(SO_4)_2$ With Some Organic Acids in Aqueous Medium

PERIODICAL: Zhurnal neorganicheskoy khimii, 1961, Vol. 6, No. 2, pp. 438 - 442

TEXT: The author studied the interaction of $Zr(SO_4)_2$ with quinic, maleic, and sulfosalicylic acid by determining the density, the viscosity, and the surface tension at 20°C. Results are given in Table 1. Fig. 1 shows density, viscosity, surface tension, and apparent volume of the precipitates in the systems $Zr(SO_4)_2$ - quinic acid - H_2O, $Zr(SO_4)_2$ - maleic acid - H_2O, and $Zr(SO_4)_2$ - sulfosalicylic acid - H_2O. Fig. 2 shows the surface tension of the system $Zr(SO_4)_2$ - quinic acid - H_2O, and that of zirconium sulfate solutions. Table 2 gives the surface tension in the system $Zr(SO_4)_2$ -

quinic acid - H_2O. By determining the viscosity and the surface tension it was found that a chemical interaction takes place between the components in the systems $Zr(SO_4)_2$ - quinic acid - H_2O and $Zr(SO_4)_2$ - sulfosalicylic acid - H_2O. No chemical interaction between the components was observed in the system $Zr(SO_4)_2$ - maleic acid - H_2O. A. K. Kirakosyan and I. V. Tananayev are mentioned. There are 2 figures, 2 tables, and 6 Soviet references.

SUBMITTED: December 8, 1959

Card 2/5

Card 3/5

S/078/61/006/002/011/017
B017/B054

Плотность, вязкость, поверхностное натяжение и кажущиеся объемы осадков в системах $Zr(SO_4)_2$ — хинная (лоная) кислота — H_2O

TABLE 1

№ смеси	Кислота : $Zr(SO_4)_2$	Ожидаемые кажущиеся объемы осадков при отсутствии взаимодействия компонентов системы, мл	Система $Zr(SO_4)_2 - C_6H_7(OH)_4 - COOH - H_2O$: d^{25}	η^{25}, пуаз	σ^{25}, дин·см$^{-1}$	Кажущийся объем осадков, мл	Система $Zr(SO_4)_2$ — $HOOC-CH=CH-COOH-H_2O$: d^{25}	η^{25}, пуаз	σ^{25}, дин·см$^{-1}$	Кажущийся объем осадков, мл
1	1:5	11,65	1,0186	1,033	74,60	9,0	1,0199	1,052	74,22	11,00
2	1:3	10,49	1,0178	1,042	74,75	7,8	1,0176	1,032	74,30	10,6
3	1:2,5	10,02	1,0179	1,050	75,00	6,4	1,0165	1,030	74,35	10,3
4	1:2	9,32	1,0167	1,075	75,10	5,7	1,0164	1,026	74,70	9,9
5	1:1,5	8,27	1,0149	1,043	75,20	3,9	1,0145	1,026	74,52	9,1
6	1:1	6,99	1,0147	0,075	75,61	2,5	1,0113	1,026	74,82	7,0
7	1,5:1	5,59	1,0131	1,048	75,55	1,8	1,0099	1,012	74,69	6,0
8	2:1	4,66	1,0111	1,052	75,53	1,6	1,0092	1,010	74,66	5,2
9	2,5:1	3,96	1,0105	1,048	75,61	1,6	1,0077	1,008	74,70	4,1
10	3:1	3,50	1,0096	1,042	75,32	1,6	1,0065	1,021	74,72	4,0
11	5:1	2,33	1,0086	1,055	75,27	1,0	1,0055	1,029	74,52	2,4
$Zr(SO_4)_2$	—	14,00	1,0227	1,070	73,89	14,0	1,0227	1,070	73,89	14,0
Хинная кислота		—	1,0058	1,056	75,24	—	—	—	—	—
Малеиновая кислота		—	—	—	—	—	1,0017	1,019	74,17	—
Сульфосалициловая кислота		—	—	—	—	—	—	—	—	—

Таблица 1
(CONT'D)
(малеиновая, сульфосалици-

S/078/61/006/002/011/017
B017/B054

Система $Zr(SO_4)_2$ — HO_3S — $C_6H_3(OH)$ — $COOH$ — H_2O		
d^{20}	η^{20}, пуаз	σ^{20}, дин·см$^{-1}$
1,0204	1,040	74,72
1,0191	1,046	74,78
1,0186	1,069	75,12
1,0175	1,068	75,04
1,0169	1,055	75,00
1,0154	1,051	75,53
1,0139	1,039	74,98
1,0130	1,036	75,15
1,0124	1,036	74,90
1,0120	1,032	74,76
1,0111	1,020	74,74
1,0227	1,070	73,89
—	—	—
—	—	—
1,0077	1,008	74,46

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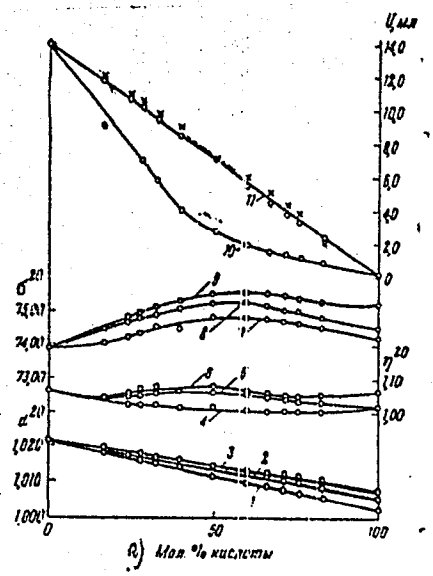

Рис. 1.

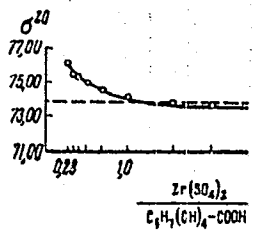

Рис. 2.

Legend to Table 1: 1: No. of mixture, 2 :cid, 3: expected apparent volume of the precipitate without interaction of components, 4: system, 5: poise, 6: dyn·cm^{-1}, 7: apparent volume of the precipitate, 8: quinic acid, 9: maleic acid, 10: sulfosalicylic acid

Legend to Fig. 1: a) mole% acid; I: $Zr(SO_4)_2$ - $C_6H_4(OH)_4COO$ - H_2O; II: $Zr(SO_4)_2$ - $C_2H_2(COOH)_2$ - H_2O;

III: $Zr(SO_4)_2$ - $C_6H_3(OH)(HO_3S)COOH$ - H_2O; density: 1 in system II, 2 in system I, 3 in system III; viscosity: 4 in system II, 5 in system III, 6 in system I; surface tension: 7 in system II, 8 in system III, 9 in system I; apparent volume of precipitate: 10 in system I, 11: expected volume of precipitate, X in system II

Card 5/5

DEYCH, A. Ya. (Riga)

Viscosity logarithm and reciprocal kinematic viscosity in the systems benzene - toluene and n-butyl alcohol - tert-butyl alcohol. Zhur. fiz. khim. 35 no.3:635-637 Mr '61. (MIRA 14:3)
(Systems(Chemistry)) (Viscosity)

YERMOLENKO, N.F.; DEYCH, A.Ya.

Possibility of forming higher order compounds in the system $AlCl_3 - CS(NH_2)_2 - H_2O$. Izv.vys.uch.zav.; khim.i khim.tekh. 5 no.4:536-538 '62. (MIRA 15:12)

1. Belorusskiy gosudarstvennyy universitet imeni Lenina, kafedra neorganicheskoy khimii.
(Aluminum chloride) (Urea)

DEYCH, A.Ya.

Chemical reaction of urea with barium bromide in an awueous medium. Zhur.neorg.khim. 7 no.6:1421-1423 Je '62. (MIRA 15:6)
(Urea) (Barium bromide)

DEYCH, A.Ya.

Additive value of viscosity of liquid systems without interaction of components. Zhur. fiz. khim. 36 no.3:656-657 Mr '62. (MIRA 17:8)

1. Rizhskiy institut inzhenerov Grashdanskogo vozdushnogo flota.

DEYCH, A.Ya.

Additivity of the viscosity logarithm and the reciprocal kinematic viscosity of binary liquid systems. Zhur.fiz.khim. 36 no.8:1777-1779 Ag '62. (MIRA 15:8)

1. Vsesoyuznyy zaochnyy institut tekstil'noy i legkoy promyshlennosti i Rizhskiy uchebno-konsul'tatsionnyy punkt.
(Systems (Chemistry)) (Viscosity)

DEYCH, A.Ya.

Density, viscosity, and specific conductivity of $CdBr_2$ solutions in acetone, water, and their mixtures. Zhur. fiz. khim. 36 no.11:2479-2480 N'62. (MIRA 17:5)

DEYCH, A. Ya.; VORONKOV, M. G.;

"Donor-acceptor properties of the siloxane bond."

Institute for organic syntheses of the Latvian Academy of Science, Riga, USSR.

Second Dresden Conference on Organic and Non-Silicate Chemistry, 26-30 March 1963; East Germany.

VORONKOV, M. G.; DEYCH, A. Ya., Riga

"Acceptor complexes of monosubstituted benzenes C_6H_5X with electron donor organic compounds."

report submitted for 8th Intl Conf on Coordination Chemistry, Vienna, 7-11 Sep 64/

ACCESSION NR: AP4040730 S/0192/64/005/003/0482/0489

TITLE: Donor-acceptor properties of the siloxane bond

AUTHOR: Voronkov, M. G.; Deych, A. Ya.

SOURCE: Zhurnal strukturnoy khimii, v. 5, no. 3, 1964, 482-489

TOPIC TAGS: siloxane bond, alkoxysilane, aryloxysilane methylsiloxane, donor acceptor property, electro acceptor bond, electro donor bond, physico chemical method

ABSTRACT: To explain the mechanism of heterolytic splitting of the Si-O bond in siloxanes and alkoxysilanes and to clarify the bond nature, more than 300 binary systems of alkoxysilanes, aryloxysilanes, methylsiloxanes and their organic analogues with electro-acceptor and electro-donor bonds were analyzed by physico-chemical methods. It has been shown that both electro-donor and electro-acceptor properties of alkoxysilanes are enhanced by a decreasing number of alkoxygroups at the central silicon atom; this is explained by both the sterical factor and the increasing polarity of the Si-O bond. A new type of molecular interaction between alkoxysilanes and polar

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ACCESSION NR: AP4040730

benzene derivatives of the C_6H_5X was found. The composition of stratified systems formed by methylsiloxanes with organic compounds was determined. Donor/acceptor properties of the siloxane bond Si-O-(Si) in siloxanes in relationship to organic molecules are usually not apparent and can but rarely be observed. Electro-donor properties decrease in the series C-O-C > C_{alk} -O-Si > C_{ar} -O-Si >> Si-O-Si > (O)-Si-O-Si while the electro-acceptor properties of the silicon atom decrease in another order Si_{ar} -O-Si > C_{alk}-O-Si >> Si-O-Si. Detailed experimental data supporting the above conclusions will be published in a series of articles on this subject. Orig. art. has: 1 figure, 1 formula, 1 table.

ASSOCIATION: Institut organicheskogo sinteza AN LatvSSR (Institute of Organic Synthesis, AN LatvSSR)

SUBMITTED: 17Mar63 / ENCL: 00

SUB CODE: IC NR REF SOV: 005 OTHER: 004

Card 2/2

DEYCH, A.Ya.

Some remarks concerning V.S. Gallinker, V.A. Tiagai, G.N. Fenerli's article "Viscosity of mixtures of aqueous electrolyte solutions." Zhur. fiz. khim. 38 no.2:525-527 F '64 (MIRA 17:8)

1. Rizhskiy institut inzhenerov Grazhdanskogo vozdushnogo flota.

DEYCH, A.Ya.; VYAZOVSKAYA, A.B.

Some physicochemical properties of aminoacetic acid aqueous solutions. Zhur. fiz. khim. 38 no.4:980-983 Ap '64.
(MIRA 17:6)

1. Rizhskiy institut inzhenerov Grazhdanskogo vozdushnogo flota.

L 12982-66 EWT(m)/EWP(j)/T RPL WW/RM

ACC NR: AP6001461 SOURCE CODE: UR/0379/65/001/005/0663/0674

AUTHOR: Voronkov, M. G.; Deych, A. Ya.

ORG: Institute of Organic Synthesis, AN Latv. SSR, Riga (Institut organicheskogo sinteza); Riga Institute of Civil Aviation Engineers (Rizhskiy institut inzhenerov grazhdanskoy aviatsii)

TITLE: Formation of complexes with charge transfer in systems of monosubstituted benzenes C_6H_5X with electron-donor organic compounds

SOURCE: Teoreticheskaya i eksperimental'naya khimiya, v. 1, no. 5, 1965, 663-674

TOPIC TAGS: intermolecular complex, benzene, electron donor

ABSTRACT: The paper deals with the formation of labile complexes with charge transfer in systems of C_6H_5X monosubstituted benzenes with organic compounds (D) containing a hetero atom with an unshared pair of electrons (O, N, and Cl). Using refractometry, from the character of n(V) isotherms of over 400 liquid binary systems C_6H_5X-D, the authors found that the tendency of C_6H_5 molecules to form complexes is most pronounced if X is a meta-orientant, and increases with increasing dipole moment of the molecule. The complexing tendency of electron-donor components (D) decreases in the following order of variation of the hetero atom in D: O $\geq$ Cl > N, and is not proportional to the basicity of the nonbenzenoid component. Complex-formation in C_6H_5X-D systems has a donor-acceptor character and is due to the transfer of an electron from D to the aromatic ring with the lower π-electron

Card 1/2

L 12982-66

ACC NR: AP6001461

density. Since the complexes formed differ from ordinary aromatic π complexes by a reverse direction of the shift of π electrons, they may be termed "reverse π complexes." The intermediate formation of "reverse complexes" during the initial stage of reactions of nucleophilic aromatic substitution is postulated. Orig. art. has: 3 figures and 4 tables.

SUB CODE: 07 / SUBM DATE: 08Mar65 / ORIG REF: 013 / OTH REF: 015

Card 2/2

DEYCH, A.Ya.

Role of deviation from additivity in the study of complex formation in electrolyte solutions from viscosity data. Zhur. fiz. khim. 39 no.3:804-805 Mr '65. (MIRA 18:7)

1. Rizhskiy institut inzhenerov grazhdanskoy aviatsii.

16.4000
16.1500

37009
S/044/62/000/003/062/092
C111/C444

AUTHOR: Deych, E. G.

TITLE: On some infinite systems of equations

PERIODICAL: Referativnyy zhurnal, Matematika, no. 3, 1962, 38, abstract 3V191. ("Zh. vychisl. matem. i matem. fiz.", 1961, 1, no. 1, 173-176)

TEXT: If the system

$x_i = \sum_{k=1}^{\infty} c_{ik}x_k + b_i$ $(i = 1,2,\dots)$ is completely regular (i.e. $\sum_{k=1}^{\infty} |c_{ik}| < 1 - \theta < 1$) and $|b_i| < P$, then this system possesses a unique bounded solution, as it is well known, where $|x_i| \leq k = P/Q$. It is proved that in case the coefficients c_{ik} and b_i being of the same sign, this estimation can be unproved:

1.) if $c_{ik} \leq 0$, $b_i \geq 0$, then $|x_i - b_i| \leq k\frac{1-\theta}{2-\theta}$ and $|x_i| \leq k\frac{1}{2-\theta}$;

Card 1/2

2.) if $c_{ik} \geq 0$, $b_i \geq 0$, then $b_i \leq x_i \leq b_i + k(1-\theta)$ and $0 \leq x_i \leq k$. The case $b_i \leq 0$ is reduced to the considered case by aid of the substitution $x_k = -y_k$.

[Abstracter's note: Complete translation.]

24.4200

S/040/62/026/005/010/016
D234/D308

AUTHOR: Deych, E. G. (Bucarest)

TITLE: An axially symmetrical contact problem for a non-plane die with circular horizontal section

PERIODICAL: Prikladnaya matematika i mekhanika, v. 26, no. 5,1962, 931-934

TEXT: The author assumes that the elevation of the points of the die in the initial state over the upper plane of the elastic half-space is given by

$$\varphi(r) = Ar^{2\lambda} \qquad (\lambda>0) \qquad (1.1)$$

and that a force Q is applied along the axis of the die. It is attempted to simplify the formulas for the radius of contact area (a), the displacement and the pressure distribution. The result is

Card 1/2

$$a^{2\lambda+1} = \frac{(\nu-1)Q}{4\nu GA}\,\frac{\Gamma(\lambda+3/2)}{\lambda\sqrt{\pi}\,\Gamma(\lambda+1)}\,,\quad \delta = Aa^{2\lambda}\,\frac{\sqrt{\pi}\,\Gamma(\lambda+1)}{\Gamma(\lambda+1/2)} \qquad (2.11)$$

$$p(r) = \left(\lambda+\frac{1}{2}\right)p^0\left(\frac{r}{a}\right)^{2\lambda-1}\sqrt{1-\frac{r^2}{a^2}}\;F\left(\lambda+\frac{1}{2},\,\frac{1}{2};\,\frac{3}{2};1-\frac{r^2}{a^2}\right)$$

$$(0<r\leqslant a) \qquad (3.9)$$

G being the displacement modulus of the half-space and $p^0 = Q/\pi a^2$. The first two expressions are derived from series expansions and the third from an integral representation. The particular cases $\lambda = 2n,\ 1/2,\ 3/2$ are analyzed.

SUBMITTED: April 25, 1962

Card 2/2

USSR/Diseases of Farm Animals. Diseases Caused by Helminths R

Abs Jour : Ref Zhur - Biol., No 19, 1958, No 88267

Author : Deych F.F.
Inst : Kazakh Scientific Research Veterinary Institute
Title : Experiment in Controlling Hemo-Onchocercosis and Chabert's Disease in Sheep of the Vostochno-Kazakhstanskaya Oblast.

Orig Pub : Tr. Kazakhsk. n.-i. vet. in-ta, 1957, 9, 464-468

Abstract : No abstract

Card : 1/1

DEYCH, G. M.

Dissertation defended for the degree of Doctor of Historical Sciences in the Institute of History

"Peasantry of the Pskovskaya Giberniya During the Second Half of the XIX and at the Start of the XX Century."

Vestnik Akad. Nauk, No. 4, 1963, pp 119-145

SOV/113-59-3-18/22

28(1)

AUTHOR: Petukhov, P.Z., Professor, Doctor of Technical Sciences Fedoseyev, A.M., Engineer and Deych, G. Sh.

TITLE: On the Application of Forging Manipulators (O primenenii kovochnykh manipulyatorov)

PERIODICAL: Mekhanizatsiya i avtomatizatsiya proizvodstva, 1959, Nr 3, pp 54-55 (USSR)

ABSTRACT: An important part in machine building is played by forging work, and, therefore, the forging press departments of large plants are already and in future will be still more fully equipped with first-rate forging presses. Alloys, weighing tens of and even hundreds of tons, are forged by such presses. The transportation of heated alloys to the presses is carried out by bridge cranes. Experience shows, that presses with forging manipulators possess a rate of production 50-80% higher than that of presses with forging cranes. Their fuel consumption is lower by 10-20%. The authors are of the opinion, that presses with pressures of up to 3 tons, can be adequately

Card 1/2

On the Application of Forging Manipulators

operated by transporting cranes only. Having given a detailed account of production costs and the price of the machine itself, the authors conclude as follows: The State Technical Scientific Committee of the USSR of the Council of Ministers and the Gosplan should be given the task of finding the very best possibilities for complex mechanization of forging press departments, and specially for the construction of forging manipulators with various load capacities.

Card 2/2

BUKANKOV, Ye.I., inzh.; DEYCH, M.M.

Use of plastic heels without plugs. Kozh.-obuv.prom. 6 no.10:34-35 O '64. (MIRA 18:1)

DEYCH, M. Ye.

"Question of Finite Losses in the Guide Channels of Steam Turbines." Sov. Kotlostroy. No. 6(1945)

DEYCH, M. Ye.

PHASE I · TREASURE ISLAND BIBLIOGRAPHICAL REPORT AID 400 - I

BOOK Call No.: AF623562

Author: DEYCH, M. YE.
Full Title: TECHNICAL GAS DYNAMICS (FUNDAMENTALS OF TURBINE GAS DYNAMICS)
Transliterated Title: Tekhnicheskaya gazodinamika (Osnovy gazodinamiki turbin)

Publishing Data
Originating Agency: None
Publishing House: State Power Engineering Publishing House
Date: 1953 No. pp.: 544 No. of copies: 5,000
Editorial Staff
Editor: None Tech. Ed.: None
Editor-in-Chief: None Appraiser: None
Others: The author thanks a number of scientists and engineers for help and mentions their names in the introduction.

Text Data
Coverage: In this book some fundamental problems of internal gas dynamics of the turbine are considered. The initial chapters cover the elements of the theory of one-dimensional and two-dimensional flow. The following chapters are dedicated to special problems of internal gas dynamics, namely the flow of gas in nozzles, labyrinths, ejectors, bladings and the turbine stage. Special attention is given

to the gas dynamics of alternating cycles of nozzles, ejectors, and turbine stage. In the concluding chapters methods are given for experimental testing of the turbine section between the inlet and the outlet. Diagrams and graphs.

This is a good textbook on fluid dynamics as applied to gas turbines. It contains a large amount of material. However, the approach to the problems studied is conventional and no special features or original solutions have been noticed.

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9-1. Short characteristic of study methods and principal layouts of testing stands; 9-2. Installations for testing bladings under static conditions; 9-3. Fittings for measuring flow parameters; 9-4. Visual methods of flow study in bladings; 9-5. Some problems of method of study of flat bladings; 9-6. Experimental turbine.

Appendix, Table of Gas Dynamic Functions 537-541
Bibliography 542-544

Purpose: This is a textbook in heat engineering approved by the Main Administration of Higher Education of the Ministry of Culture of the USSR. It may be used by students of senior courses, and also by technical workers of turbine construction plants and design bureaus.

Facilities: Some names of research institutes are mentioned.

No. of Russian and Slavic References: A number of articles and books are listed for each chapter of the book.

Available: A.I.D., Library of Congress.

7/7

DEYCH, M. Ye.

"The Flow of Gas Through Turbine Bucket Grids" Gosudarstvennoye Energeticheskoye Izdatel'stvo, Moscow-Leningrad, 1953, pp 312-420, 542-544.

Translation of Chapter VII of Tekhnicheskaya Gazodinamika, 568478

DEYCH, M. Ye.

SAMOYLOVICH, Georgiy Semenovich; TROYANOVSKIY, Boris Mikhaylovich; [illegible]EICH, M.Ye., redaktor; SHCHEGLYAYEV, A.V., redaktor; FRIDKIN, A.M., tekhnicheskiy redaktor.

[Variable working cycle of steam turbines] Peremennyi reshim raboty parovykh turbin. Pod red. A.V.Shcheglinaeva. Moskva, Gos.energ.izd-vo 1955. 280 p. [Microfilm] (MIRA 8:5)

1. Chlen-korrespondent AN SSSR (for Shcheglyayev).
(Steam turbines)

Deych, M. Ye.

AID P - 2870

Subject : USSR/Engineering

Card 1/1 Pub. 26 - 3/16

Authors : Deych, M.Ye., Kand. Tech. Sci., and Zaryankin, A.Ye., Eng.

Title : Research and improvement of nozzle plates of the control stage

Periodical : Teploenergetika, 10, 14-20, O 1955

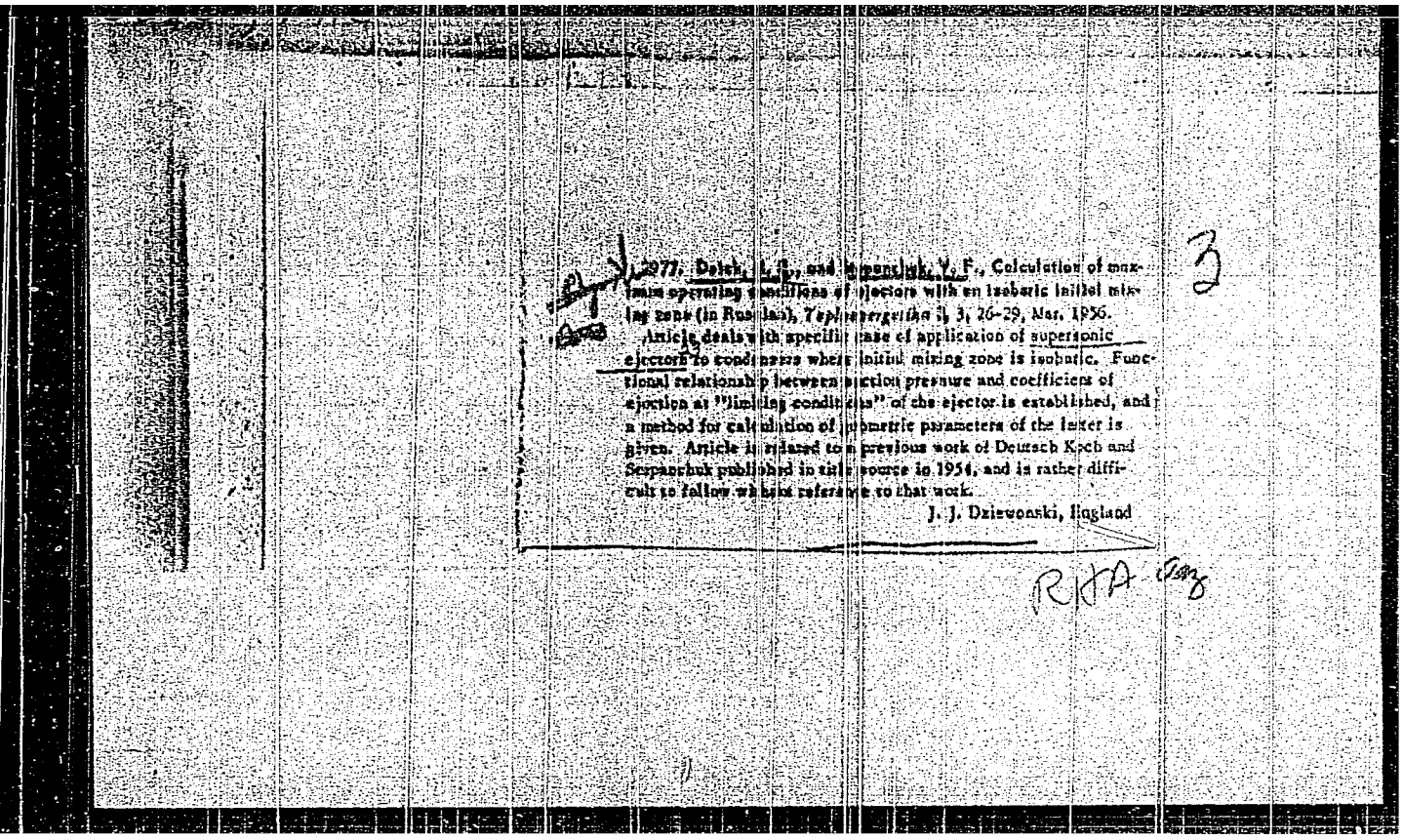
Abstract : Some results of research on nozzle plates, made in order to compare the operation of the two main types (the narrowing and the widening profile) are discussed. The research method, the characteristic of the nozzle plates, and the results achieved are explained in detail. Twelve diagrams. One Russian reference, 1954, 1 German, 1910.

Institution : Moscow Power Institute

Submitted : No date

DEYCH, M.Ye.

[Experimental studies and the principles of aerodynamic calculation of steam and gas turbine stages] Eksperimental'nye issledovaniia i osnovy aerodinamicheskogo rascheta stupenei parovykh i gazovykh turbin. Avtoreferat dissertatsii na soiskanie uchenoi stepeni doktora tekhnicheskikh nauk. Moskva, Moskovskii ordena Lenina energeticheskii institut im. V.M.Molotova, 1956. 42 p. (MLRA 10:3)
(Turbines--Aerodynamics)



2977. Deich, L. E., and Stepanchuk, V. F., Calculation of maximum operating conditions of ejectors with an isobaric initial mixing zone (in Russian), *Teploenergetika* 3, 3, 26-29, Mar. 1956.

Article deals with specific case of application of supersonic ejectors to condensers where initial mixing zone is isobaric. Functional relationship between suction pressure and coefficient of ejection at "limiting conditions" of the ejector is established, and a method for calculation of geometric parameters of the latter is given. Article is related to a previous work of Deutsch Kpcb and Stepanchuk published in this source in 1954, and is rather difficult to follow without reference to that work.

J. J. Dziewonski, England

DEYCH, M.E.

AID P - 4224

Subject : USSR/Heat and Power Engineering

Card 1/1 Pub. 110 a - 5/15

Authors : Deych, M. E. and V. F. Stepanchuk, Kands. Tech. Sci.

Title : Computing operational limits of ejectors with an initial isobaric mixture (stage).

Periodical : Teploenergetika, 3, 26-29, Mr 1956

Abstract : The article reports on experimental data obtained on supersonic ejectors and gives a detailed analysis for the computation of formulae for indraft pressure for the limit of the ejection ratio and of the limit of back pressure. Four diagrams.

Institution : Moscow Power Engineering Institute

Submitted : No date

Deych, M. E.

AID P - 4377

Subject : USSR/Power Engineering

Card 1/1 Pub. 110 a - 3/17

Authors : Deych, M. E., V. V. Frolov, Kand. Tech. Sci., and A. V. Gubarev, Eng., Moscow Power Institute

Title : Research on new shapes of cascades and pressure stages in turbines.

Periodical : Teploenergetika, 5, 13-22, My 1956

Abstract : Experiments with a series of bladings of new shapes including research at supersonic velocity, are described. Basic aerodynamic data of new blading are given. Mathematical analyzes of various control and pressure stages designs are presented. Twelve figures, 6 tables..

Institution : None

Submitted : No date

Name: DEYCH, Mikhail Yefimovich

Dissertation: Experimental studies and bases of aerodynamic calculation of stages of steam and gas turbines

Degree: Doc Tech Sci

Affiliation: [not indicated]

Defense Date, Place: 26 Oct 56, Council of Moscow Order of Lenin Power Engineering Inst

Certification Date: 18 May 57

Source: BMVO 15/57

DEYCH, M.YE.

BARANOV, V.A., kandidat tekhnicheskikh nauk; DEYCH, M.Ye., kandidat tekhnicheskikh nauk.

Experimental apparatus for determination of grate characteristics by the method of reactive power weighting. Teploenergetika 4 no.3: 28-31 Mr '57. (MLRA 10:3)

1. Moskovskiy energeticheskiy institut.
(Boilers--Testing)

Deych, M.E.

250

AUTHORS: Shcheglayev, A. V. (Corresponding Member Ac.Sc. USSR) and Deych, M.E. (Cand. Tech. Sc.) (Moscow Power Institute)

TITLE: Certain questions relating to increasing the efficiency of steam turbines. (Nekotorye voprosy povysheniya ekonomichnosti parovykh turbin).

PERIODICAL: "Teploenergetika" (Thermal Power), Vol.4, No.4, April, 1957, pp. 3 - 6 (U.S.S.R.)

ABSTRACT: Most of the work that has been done on aerodynamics of the flow parts has been concentrated on the intermediate stages. It is quite recently and only in the Moscow Power Institute that the regulating stages have been investigated, whilst the treatment of low pressure stages with small d/l ratios at high subsonic and supersonic speeds has hardly been commenced. In this article the authors consider some questions of the efficiency of steam turbines and of the losses which are associated with design and manufacture in order to judge of the best directions for future research. With the use of high steam conditions leakages acquire particular importance. Leakages may occur in the fixings of the nozzle segments of the regulating stages. Leakage can occur through butt joints and it is particularly difficult to make a steamtight joint around the edges of segments. Leakages can also occur around diaphragms and particularly at the annular surface where the

Certain questions relating to increasing the efficiency of steam turbines. (Cont.)

diaphragm joins the frame. It is particularly important to maintain in operation minimum clearances at the glands. In many turbines the glands wear, and this increases losses from steam leakage. Correct selection of the regulating stages has a considerable influence on the efficiency of a turbine. In turbines with high initial steam temperature the regulating stage should be designed for a considerable heat drop. Curtis wheels with two rows of blading which have been used in these stages in the past do not have high enough efficiency and new turbines are being designed with a single row of blades on this wheel. However, work has recently been done in the Moscow Power Institute to improve the efficiency of wheels with two rows of blading and efficiencies of 72 to 75% have been obtained. Therefore, it may be again advisable to use such stages in some types of turbine for high steam conditions. The work which has been done on the intermediate stages of turbines has resulted in satisfactory efficiency. However, available data suggests that it is not always possible to find the best solution which gives the smallest loss due to flow of steam over the binding on the working blades, and improvements in this respect could be achieved.

Certain questions relating to increasing the efficiency of steam turbines. (Cont.)

Little work has been done on the low pressure section. Such theoretical investigations as there have been have included simplifying assumptions. Practically all the methods of profiling long blades do not allow for important special features of the actual spatial flow in such stages. Experimental investigation of stages with low d/l ratio are mainly carried out on air models of turbines. These results cannot easily be extended to a group of low pressure stages because the tests are carried out at relatively low speeds whilst in real stages the velocities are either subsonic or supersonic. Tests in power stations have shown that the efficiency of the later stages of high power turbines is low. More attention is required to the design of blading for low pressures and very high speeds. The use of Baumann two row stages for high power turbines requires further consideration. Operating tests have shown that the live steam governing valves operate with high losses. Investigations should be directed to developing valves of better aerodynamic shape and diffusors that will reduce losses to a minimum. Difficulties arise because laboratory investigations are often carried out on model installations which cannot fulfil all the requirements of similarity. It is

Certain questions relating to increasing the efficiency of steam turbines. (Cont.)

necessary to develop practical questions of modelling so that the main requirements of similarity are fulfilled. Finally, it is most important to make full scale tests on new and reconstructed turbines in power stations. Insufficient attention is being paid to this matter. It is surprising that the Kharkov turbine works still has no laboratory and that the Leningrad works has not used for experiments a high pressure Heat and Electric Power Station that is on its very doorstep. No figures, no literature references.

AUTHORS: Deych, M.E. (Cand. Tech. Sci.), Samoylovich, G.S. (Cand. Tech.Sci.), Troyanovskiy, B.M. (Cand. Tech. Sci.), Kazintsev, F.V. (Engineer) and Lipatnikov, S.N. (Eng.)

TITLE: Investigation of two-crown regulating stages in an experimental steam turbine. (Issledovaniye dvukhvenechnykh reguliruyushchikh stupeney v parovoy eksperimental'noy turbine).

PERIODICAL: "Teploenergetika" (Thermal Power), Vol.4, No.5, May,1957, pp.35-43 (U.S.S.R.)

ABSTRACT: Operating test results have shown that the regulating stages having two sets of blading on a single runner that are used by steam turbine factories are of low efficiency. Therefore, turbine designers try to avoid the use of such stages in high power turbines. However, hitherto, such stages have not been systematically investigated, the reasons for their low efficiency have not been established and methods of improving the efficiency have not been indicated. This article describes new 2-crown regulating stages that have been developed in the Moscow Power Institute intended for various heat drops and steam consumptions. The explanations of the type of stage and of the experimental conditions are all expressed in terms of Soviet conventional notation which is assumed to be so familiar to the reader as to require no explanation. The experimental set-up is described, the available experimental turbine having the following limiting

. . .;

Investigation of the two-crown regulating stages in an experimental steam turbine. (Cont.)

conditions: maximum power 600 kW, maximum speed 12 000 r.p.m.; initial pressure 1 to 5 atm.; maximum initial temperature 150 to 300°C and exhaust pressure 0.1 to 2 atm. The turbine is loaded by a hydraulic brake. The main geometrical characteristic of the stages tested are described with full information about blade profiles and dimensions. The results of the tests are presented in the form of graphs of the internal and blade efficiencies.

The experiments carried out were of a preliminary nature. For a number of operational reasons unstable conditions were obtained with a deep vacuum beyond the stage and it was, therefore, impossible to obtain a reliable efficiency value for certain conditions and particularly for low Reynolds numbers. Moreover, the relative error of the experiment is higher with deep vacuums because the power of the stage is less. However, the test results are of interest in that they give a qualitative picture of the relationship between efficiency and Reynolds number. Graphs illustrating this point are given. Information is also given about changes in the reaction under different conditions and the results of investigations on the stages with partial supply of steam. Some results are also given on a

Investigation of the two-crown regulating stages in an experimental steam turbine. (Cont.)

detailed investigation of the structure of flow in the stages, including graphs of pressure distribution over the profile of the blading.

It is concluded that stage type KS-1A is of high efficiency over a fairly wide range of conditions. With partial supply of steam the blade and internal efficiencies of the stage are reduced. Protective housings and longitudinal glands on the boundaries of the arc of steam supply should be installed to reduce windage losses. General agreement was found between the pressure distributions over the profile determined under static conditions and by calculations. There is reason to think that similarity of pressure fields is observed during tests using steam and air. 11 figures, 1 literature reference (Russian).

Card 3/3

96-58-2-20/23

AUTHOR: Deych, M.Ye., Doctor of Technical Sciences

TITLE: A Coordinating Conference on Investigations on the Flow Part of Steam Turbines (Koordinatsionnoye soveshchaniye po issledovaniyam protochnoy chasti parovykh turbin)

PERIODICAL: Teploenergetika, 1958, No 2, pp 91 - 93 (USSR)

ABSTRACT: This is a brief account of a conference called by the Steam Turbine Section of the High Pressure Steam Commission of the AS USSR (Kommissiya para vysokogo davleniya AN SSSR) and held in Moscow from October 8 - 11, 1957. The conference was attended by representatives of the leading factories and research and teaching institutes. The results of investigations on the flow parts of steam turbines carried out during 1956-57 and the plan of work for 1958-1962 were considered. The conference noted that a particularly important development of recent times had been the extension of existing works laboratories and the organisation of a number of new ones. Reports were made of investigations on regulating stages. Particular reference was made to the work done to raise the efficiency of double-row regulating stages. The efficiency of 100 and 150 MW turbines has been appreciably increased by re-design of the regulating stages.
Numerous reports dealt with increasing the efficiency of

Card1/3

A Coordinating Conference on Investigations on the Flow Part of Steam Turbines

intermediate stages. A report was made on the preparation of standard blade profiles for intermediate stages and another on the testing of intermediate stages in experimental turbines. There was also an account of work on stages with long, twisted blades.

A good deal has been done to modernise existing sets, applying recent research work. The manufacturing shops have made numerous tests on prototypes.

The conference approved the main directions of work on regulating and intermediate stages but pointed out that there had been insufficient theoretical and experimental attention to the following subjects: modelling of blading, exhaust sections and valves; study and improvement of the later stages of turbines and experimental work on the degree of reaction and other design features of intermediate stages. The conference emphasised the importance of evolving a more accurate procedure for the thermal design of the flow part of steam turbines. This work is going slowly. Investigations on turbines installed in power stations are being made by only three organisations and not enough is being done. Co-ordination of work between different laboratories is

Card2/3 weak and the conference took special decisions on this question.

96-58-2-20/23

A Co-ordinating Conference on Investigations on the Flow Part of Steam Turbines

In conclusion, the conference considered and confirmed the proposed thematic plan of research work to raise the efficiency of steam turbines for the period 1958-1962.

AVAILABLE: Library of Congress

Card 3/3

1. Steam turbines-Characteristics

GUBAREV, A.V.; DEYCH, M.Ye.

Certain features of a supersonic flow in active cascades. Nauch. dokl. vys. shkoly; energ. no.2:163-170 '58. (MIRA 11:11)
(Cascades (Fluid dynamics))

DEYCH, M.E.

96-3-6/26

AUTHOR: Deych, M.E. (Dr. Tech.Sci.) & Zaryankin, A.E.(Cand.Tech.Sci.)

TITLE: An experimental investigations of the turbulent boundary layer at high subsonic speeds. (Eksperimental'noye issledovaniye turbulentogo pogranichnogo sloya pri bol'shikh dozvukovykh skorostyakh.)

PERIODICAL: Teploenergetika, 1958, ... No.3. pp. 21-25 (USSR)

ABSTRACT: In order to investigate the turbulent boundary layer at high subsonic speeds the Moscow Power Institute set up the rig illustrated diagrammatically in Fig.1. The boundary layer investigated was set up on the straightground section of the upper insert 1. To ensure that the boundary layer was turbulent a shallow groove was cut. A micro-nozzle was fitted 120 mm from the groove. The micro-nozzle was positioned by means of a micrometer screw. The installation could be used to determine the characteristics of the boundary layer during independent change in the M and Re numbers and the pressure gradient. The magnitudes determined by direct measurement were the initial pressure, the pressure of complete retardation in the boundary layer, the temperature of complete retardation, the static pressure along the investigated surface and the static pressure across the boundary layer at the section where the nose of the micro-probe was. In almost all of the tests the change of the static pressure in the boundary layer was small. Several equations required in the work are formulated. Fig.2. gives six velocity profiles obtained at a constant Reynolds number of 2.5×10^6 with the

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An experimental investigation of the turbulent boundary layer at high subsonic speeds.

number M variable. All the experimental points within the range M = 0.31 - 0.98 lie on a single curve, an expression for which is given; without great error the curve can be replaced by a straight line, the formula for which is given. Other formulae are, of course, possible, and any relationship that satisfactorily approximates the velocity profile in the boundary layer of an incompressible liquid can be extended to a flow of compressible fluid. The extrapolation need not be limited to sonic speed but can be extended to low supersonic speeds, but in this case it is difficult to obtain pure gradientless flow. From the results it is also possible to calculate values of the integral thicknesses of the layer and to construct curves of them as a function of M as shown in Fig.3. The scatter of experimental points near sonic speeds occurs because of 'confusor' type flow. The scatter of points at subsonic speeds occurs because the points relate to different values of Reynolds number. The experimental results are in full accordance with theory. Experimental values for the height of the boundary layer for different values of M are given in Fig.4. On nearing the sonic speed the reduction in thickness of loss of impulse is about 15%. Since the velocity profile is independent of M it may be supposed that Re is the main parameter that determines the velocity profile

An experimental investigation of the turbulent boundary layer at high subsonic speeds.

in the absence of a pressure gradient, and the results of numerous experiments on its influence in an incompressible fluid can be extrapolated to a flow in a compressible fluid. Fig.5. gives six velocity profiles obtained whilst varying Re whilst keeping M constant. Increase in Re from 0.61 - 1.08 x 10^6 causes a characteristic change in the velocity profile, but further increase in Re does not cause a change in the velocity profile. Therefore, for values of Re greater than about 1 x 10^6 the velocity profiles are expressed by the general relationship Eq(6). At high speeds the influence of Re on the turbulent boundary layer is qualitatively of the same order as in flows of incompressible fluid. To investigate the influence of M in the presence of a pressure gradient, velocity profiles were determined in the diffusor region (Fig.6A) and during 'confusor' flow Fig. 6B. The curves show that all the experimental points fall on a single curve, whatever the value of M. This confirms the conclusion that at subsonic speeds change in M does not cause appreciable change in the velocity profile. The influence of compressibility on the structure of the turbulent boundary layer is indirect. Change in the longitudinal pressure gradient, from a positive to a negative value, leads to considerable deformation of the velocity profiles and is clearly seen from the curves in Fig.7. From the curve given in Fig.8. it follows that when the velocity distribution at the outer edge of the boundary layer is

An experimental investigation of the turbulent boundary layer at high subsonic speeds. 96-3-6/26

approximately linear calculations by the single parameter method are justified. A more general conclusion cannot be drawn in the absence of experimental data relating to other values of the second differential coefficient. There are 8 figures and 3 literature references (Russian).

ASSOCIATION: Moscow Power Institute (Moskovskiy Energeticheskiy Institut).

AVAILABLE: Library of Congress.

Card 4/4

DEYCH, M.Ye.; BARANOV, V.A.; ROZANOV, K.A.

Investigating cascades of profiles of turbines by weighing the reactive power. Nauch.dokl.vys.shkoly; energ. no.3:139-148 '58. (MIRA 12:1)

(Turbines)

DEYCH, M.Ye.; ZAKYANKIN, A.Ye.; SHERSTYUK, A.N.; DINEYEV, Yu.N.

Investigation of gate mechanisms of radial-flow turbines.
Nauch.dokl.vys.shkoly; energ. no.4:195-206 '58.
(MIRA 12:5)

1. Rekomendovana kafedroy parovykh i gazovykh turbin Moskovskogo energeticheskogo instituta.
(Gas turbines)

AUTHORS: Deych, M.Ye., Doctor of Technical Sciences, SOV/96-58-5-2/27
Troyanovskiy, B.M., Candidate of Technical Sciences and
Kazintsev, F.V., Abramov, V.I., Engineers

TITLE: Comparative Tests on a Two-row Velocity Stage (Sravnitel'-
nyye issledovaniya dvukhvenechnykh stupeney skorosti)

PERIODICAL: Teploenergetika, 1958, Nr 5, pp 9 - 16 (USSR).

ABSTRACT: Work done at the MEI (Moscow Power Institute) has led to the development of several two-row velocity wheels. One of these, stage KS-1A, was thoroughly tested in the experimental steam turbine of the Moscow Power Institute. The experimental procedure and test result were described in an article in Teploenergetika, 1957, Nr 5. They relate to a wheel with a mean diameter of 400 mm and a nozzle height of 15 mm and another with a diameter of 534 mm and height of 20 mm. Tests were also made on a stage, type KS-1A-3, with a wheel diameter of 668 mm and nozzle height of 25 mm. Curves of the internal efficiency of this stage with full steam supply are given in Figure 1. Thus, test results were obtained on three identical stages with constant d/l ratio and different absolute values of d and l. As will be seen from the table, the area ratios differed for each stage and this affected the stage reaction to some extent. Graphs of the mean total reaction for velocity stage

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KS-1A are given in Figure 2. The results of the tests on the three stages are then compared. The effect of blade height on stage efficiency is shown in Figure 3.
It is of particular interest to compare the results for the new stages with best Soviet and foreign practice. Therefore, a detailed investigation was made of a two-row stage, type Nr 113, manufactured by the LKZ. The dimensions and clearances of stages KS-1A-3 and stage Nr 113 are given in dimensioned sketches, Figure 4. Test results for stage Nr 113 with full steam supply are given in Figure 5. The maximum internal efficiency was 71%: the total mean reaction of the stage, plotted in Figure 6, is practically linear relationship with the velocity ratio and increases with increase of the heat drop on the stage. The steam consumption of stage Nr 113 is plotted in Figure 7.
Tests were also made with different axial gaps. When the axial gap between the outlet edge of the nozzle and the inlet edges of the working blades of the first row is altered from 2.5 to 5.5 mm, the stage efficiency falls, as shown in Figure 8. The tests were made with the radial and all other axial gaps constant.

Investigations were then made on stage Nr 113 with steam supplied over only part of the arc; the gaps were unchanged and no special shields were used. The effect of partial steam-supply on the internal efficiency is shown graphically in Figure 9 and data on the mean total stage reaction are given in Figure 10. It follows from the results that different procedures should be used in selecting the design stage reaction for full and for partial steam supply.

Velocity stages with expanding nozzles are used for operation at high supersonic drops. Two-row stages with expanding nozzles were investigated. One had the same working and guide blades as type Nr 113 with contracting nozzles as described above; the other had straighter-bladed guide vanes similar in shape to those of a compressor. The blade geometry is discussed.

The graph of internal efficiency for stage Nr 113 with expanding nozzles and full steam supply is given in Fig 11. The efficiency is appreciably lower than for a stage with contracting nozzles.

The efficiency and test results of different velocity stages are compared, noting, however that the procedures are still

insufficiently developed. Even stages tested in one and the same turbine differ in their geometrical characteristic in a way which affects the efficiency. Various methods are used in this article to compare velocity stages, Internal efficiency curves with full steam supply for all stages are shown in Figure 12: all stages were tested in the same experimental turbine, using the same procedure. The best results were obtained with the Moscow Power Institute stage KS-1A-3 with a mean wheel diameter of 668 mm and a nozzle height of 25 mm. Here, the maximum efficiency is 81% but cannot be compared directly with stage Nr 113 because of the considerable difference in dimensions. However, if the curves of the KGTZ (Khar'kov Turbo-generator Works) are used to recalculate the results for stage Nr 113 to the dimensions of stage KS-1A-3, its efficiency is increased by only 2.5% and becomes 73.8%. The stage efficiencies of different wheels are then discussed; the internal efficiencies of velocity stages KS-1A-2 (with welded diaphragm) and of stage Nr 113 as a function of nozzle area are given in Figure 13. Throughout the range, the efficiency of stage KS-1A-2 is higher.

SOV/96-58-5-2/27

Comparative Tests on a Two-row Velocity Stage

It is concluded that stage Nr 113 is of satisfactory efficiency under sub-critical conditions but beyond this it drops markedly and is still worse with expanding nozzles. However, the Moscow Power Institute stage KS-1A with a nozzle height of 25 mm and a diameter of 668 mm had the very high maximum internal efficiency of 81%, which confirmed the high efficiency of this combination at a low degree of reaction. Stage KS-1A was better than stage Nr 113 in efficiency and stability, particularly with partial steam supply. It should be borne in mind that stage Nr 113 is more carefully manufactured and has assembled milled nozzles, whereas stage KS-1A was tested with a welded diaphragm. There are 13 figures, 1 table and 1 Soviet reference.

ASSOCIATION: MEI

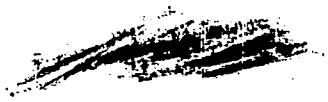
1. Turbine wheels--Design 2. Turbine wheels--Test results
3. Turbine wheels--Effectiveness

Card 5/5

DEYCH, M.Ye., doktor tekhn.nauk; GUBAREV, A.V., inzh.

Studying turbine working cascades at high speed [with summary in English]. Teploenergetika 5 no.12:56-62 D '58. (MIRA 11:12)

1. Moskovskiy energeticheskiy institut.
(Turbines)



DEYCH, M.Ye., doktor tekhn.nauk; ZARYANKIN, A.Ye., kand.tekhn.nauk

Approximate method for calculating the terminal losses [with summary in English]. Teploenergetika 5 no.9:57-60 S '58. (MIRA 11:10)

1.Moskovskiy energeticheskiy institut.
(Turbines)

DEYCH, M.Ye., prof. doktor tekhn. nauk; SAMOYLOVICH, G.S., dots. kand. tekhn. nauk; KAZINTSEV, F.V., inzh.

Setup for automatizing the static tests of turbine cascades. Energomashinostroenie 4 no.9:4-8 S '58. (MIRA 11:11)
(Turbines—Aerodynamics)

SOV/96-58-9-10/21

AUTHORS: Deych, M.Ye. (Doctor of Technical Science) and Zaryankin, A.Ye. (Candidate of Technical Science)

TITLE: An Approximate Method of Calculating Terminal Losses in Turbine Blading (Priblizhennyy metod rascheta kontsevykh poter')

PERIODICAL: Teploenergetika, 1958, Nr 9, pp 57 - 60 (USSR)

ABSTRACT: A great deal of experimental data has been accumulated on the structure of flow in straight gratings of turbine blades and on the magnitude of terminal losses. The experimental results show that in a straight grating of turbine blades there is a complex spatial flow of working substance which cannot yet be calculated adequately. Existing methods of evaluating terminal losses depend on a number of simplifying assumptions. It is, therefore, of interest to attempt to derive a formula for these losses. Formula 16 is then derived: one of its factors is a function of the dimensionless velocity, and can be obtained from the curve given in Fig 1. Numerical values of the other two factors in the formula can be determined from Fig 2, which gives a graph

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SOV/96-58-9-10/21

An Approximate Method of Calculating Terminal Losses in Turbine Blading

of experimental data for terminal losses obtained for impulse and reaction blading with different values of pitch, height and inlet and outlet angles. It is concluded that the coefficients depend on the flow conditions in the boundary layer and on the type of blading. Allowing that the results given in Fig 2 were made in different laboratories with different experimental procedures, the scatter of the results is acceptable. Values of the coefficients to be used in the formula that have been derived from the test results are tabulated.

There are 2 figures, 1 table, 4 literature references (Soviet)

ASSOCIATION: Moskovskiy energeticheskiy Institut (Moscow Power Institute)

1. Turbine blades--Performance 2. Mathematics--Applications

Card 2/2

SOV/96-58-12-10/18

AUTHORS: Deych, M.Ye. (Dr.Tekh.Sci.)
Gubarev, A.V. (Engineer)

TITLE: The investigation of working blades of turbines at high speed. (Issledovaniye rabochikh reshetok turbin pri bol'shikh skorostyakh)

PERIODICAL: Teploenergetika, 1958, No.12, pp. 56-62 (USSR)

ABSTRACT: As there are no theoretical methods of designing turbine blading for super-critical speeds, experimental developments assume great importance. At supersonic speeds the leading edge must be as sharp as possible and the back inlet face should only have slight curvature. To ensure stable flow in the channel between the blades it is necessary to avoid severe acceleration on the back profile. One way of doing this is to profile the back of the blade in such a way that there is steady constriction of the flow up to the inlet section of the channel between the blades. Because of the nature of the resultant flow, this method may be called step wise retardation of flow. A second method of achieving this object is to make the curvature at the inlet section of the back of the blade as small as possible and to ensure that there is a sharp change of velocity before the blade. At low supersonic speeds the stepwise method can be used. At high supersonic speeds the stepwise retardation of flow is preferable. Alternatively, the channel between the blades may be constructed so that the jump occurs within the channel and retardation takes place in a system of steps

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of compression on a small inlet section of the channel. The inter-blade channel should be either expanding (first method) or contracting-expanding (second method). The main types of blade profile are illustrated in Fig.1; Fig.1a. shows profile type A intended for sub-critical speeds of Mach 0.9; Fig.1b. shows profile type B intended for Mach 0.9 - 1.25; Fig.1c. illustrates profile type C using the method of stepwise retardation, and Fig.1d. shows the profile type C using the direct jump method. Both class C profiles are used for high supersonic speeds of Mach greater than 1.3. An article by Deych and others in Teploenergetika, 1956, No.5. gave a notation of blading and profiles which is adopted here. The pressure distribution over profile TR-1B, seen in Fig.3., is noticeably dissimilar and the differences are discussed. Corresponding curves over profile TR-2B, which is designed to turn the flow through smaller angles, are presented in Fig.4. Velocity distribution curves over profile TR-1B with somewhat different angles, are given in Fig.5. The distributions of losses over the height of the blading are plotted in Fig.6., and the merits of the different bladings are compared. Graphs of profile losses in group B blades appear in Fig.7. Total loss curves for different types of blading are given in Fig.8. Plots of supersonic flow in turbine blading are sketched in Fig.9; the difference between

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the flow in type A blades (Fig.9a) and type B blades (Fig.9b) is explained. The distribution of the flow outlet angle over the height of blading TR-1B is graphed in Fig.10. The terminal losses and the Mach number are related graphically in Fig.11., demonstrating that losses diminish rapidly as the Mach number increases. It is concluded that for Mach numbers of 0.9 - 1.0 it is necessary to use blades of group A. Blades of these profiles have low losses and stable characteristics over a wide range of angles of flow inlet. For Mach numbers of 0.9 - 1.25 the profiles should have sharp inlet edges and small curvature of the back of the blade on the inlet sections; also, there should preferably be straight sections in the region of the inlet and outlet edges. Profiles of group B cannot be used for high supersonic speed. The curves of total losses given in Fig.8. include two related to blades of group C designed in accordance with the principles explained in the article. Preliminary test results have shown the correctness of the basic idea and a new series of blading should accordingly be developed for high supersonic speeds. There are 11 figures and 7 references, 5 of which are Soviet.

ASSOCIATION: Moscow Power Institute (Moskovskiy Energeticheskiy Institut)

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10(0) PHASE I BOOK EXPLOITATION SOV/2214

Deych, Mikhail Yefimovich, and Georgiy Semenovich Samoylovich

Osnovy aerodinamiki osevykh turbomashin (Fundamentals of the Aerodynamics of Axial-flow Turbomachinery) Moscow, Mashgiz, 1959, 427 p. Errata slip inserted. 3,500 copies printed.

Reviewer: V.S. Beknev, Candidate of Technical Sciences; Eds.: A.N. Sherstyuk, Candidate of Technical Sciences, Docent, and A.Ye. Zaryankin, Candidate of Technical Sciences; Tech. Ed.: B.I. Model; Managing Ed. for Literature on General Technical and Transport Machine Building: V.I. Kubarev, Engineer.

PURPOSE: This book is intended for engineers, scientific workers, and aspirants. It may also be used by students of advanced courses of power engineering institutes.

COVERAGE: This book deals with theoretical and experimental work on the aerodynamics of axial-flow turbomachines and the methods of

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analyzing the flow of viscous fluids and perfect fluids over aerodynamic cascades of blades. The results of systematic investigation of subsonic and supersonic flow in plane, straight, and annular cascades are given. It includes the basic aspects of three-dimensional flow in the stages of turbomachines, and nonstationary and burble phenomena in the stages of axial-flow compressors. Methods for experimental investigation and the experimental apparatus are described. The book also gives a generalization of some theoretical and experimental results obtained at the MEI (Moscow Power Engineering Institute) and other Soviet and non-Soviet organizations and laboratories. Much experimental material was obtained in the steam-and gas-turbine laboratory of the Moscow Power Engineering Institute (1957 included) by the gas-turbine group. The following persons took part in the investigations: Candidates of Technical Sciences B.M. Troyanovskiy, A.N. Sherstyuk, V.A. Baranov; Engineers V.I. Abramov, L.Ye. Kiselev, Ye.V. Mayorskiy, I. Neruda, M.F. Zatsepin, V.P. Mayorskiy, G.A. Filippov, V.G. Filippova, Ye. V. Stekol'shchikov, V.P. Novoderezhkin, and Senior Laboratory Technicians N.S. Sokolov and P. D. Kustov. Many of the investigations were carried out in conjunction with the Kaluzhskiy turbinnyy zavod (Kaluga Turbine Plant) and the Lenin-

gradskiy metallicheskiy zavod (Leningrad Metalworking Plant). The experimental shop of the Kaluga Turbine Plant manufactured models for the experimental units of the steam-and gas-turbine department of the Moscow Power Engineering Institute. Some of the published materials on the investigation of valves and nozzles were submitted by the authors to the Leningrad Metalworking Plant and to the Kirovskiy zavod (Kirov Plant). Chapters III, VI, and VII, were written jointly by the authors; Chapters I, II, VIII, and XI were written by Samoylovich; Chapters IV, V, IX, and X, by M.Ye. Deych; Paragraphs 39, 40, 41, and 42 of Chapter VII were compiled by F.V. Kazintsev; Paragraphs 12 and 13 of Chapter III were written jointly with A.Ye. Zaryakin; Chapter V, was written jointly with A.V. Gubarev. In the text, the following Russian scientists are mentioned in connection with the development of turbomachinery in the USSR: N.Ye Zhukovskiy, S.A. Chaplygin, L.I. Sedov, N.Ye. Kochin, L.A. Simonov, E.L.Blokh, D.A. Voytashevskiy, G.Yu. Stepanov, M.I. Zhukovskiy, L.A. Dorfman, A.F. Lesokhin, A.I. Borisenko, B.L. Ginsburg, O.I. Novikova, F.I. Frankl, G.A. Buga-

yenko, R.M. Fedorov, Yu.I. Shvets, L.G. Loytsyanskiy, L.Ye. Kalikhman, N.M. Markov, B.M.Yakob, G.Flyngel, N.A. Sknar', A.N. Krylov, I.I. Kirillov, G.N. Abramovich, M.A. Lement'yev, B.N. Yuryev, V.P. Vetchinkin, K.A. Umakov, V.V. Uvarov, V.G. Tyryshkin, S.I. Shevyakov, P.K. Kazandzhan, L.P. Lokoy, V.N. Yershov, A.M. Zavadovskiy, S.V. Grishchukov, S.M. Shlyakhtenko, and N.I. Panteleyev.

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DEYCH, M.Ye.; ROBOZHEV, A.V.

Ultimate conditions for jet compressors. Nauch.dokl.vys.shkoly; energ. no.1:175-180 '59. (MIRA 12:5)

1. Rekomendovana kafedroy parovykh i gazovykh turbin Moskovskogo energeticheskogo instituta.
(Compressors--Aerodynamics)

SOV/96-59-4-7/21

AUTHORS: Deych, M.Ye., Doctor of Technical Sciences;
Troyanovskiy, B.M., Candidate of Technical Sciences;
Kazintsev, F.V, Engineer and
Abramov, V.I., Engineer

TITLE: An Investigation of a Series of Single-row Stages (Issledovaniye serii odnovenechnykh stupeney)

PERIODICAL: Teploenergetika, 1959, Nr 4, pp 38-43 (USSR)

ABSTRACT: A number of types of nozzle and working blading for turbines have been developed in the Moscow Power Institute. These can be combined in various ways in single- and two-row stages. Tests results on a number of two-row velocity stages have already been published in Teploenergetika, 1958, Nr 5. Six combinations of single-row stages were made up of blading intended for operation at subsonic and sonic velocities. The stage combinations consisted of two nozzle and three working blades. All the stages were 534 mm diameter, 25 mm nozzle blade height and 28 mm working blade height and were all of the same width. A stage diagram is given in Fig.1. The experimental steam turbine and the procedure used were the same as described in Teploenergetika, 1957, Nr 5. Particulars of the stages

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tests are tabulated. The stages were first tested with full steam supply. Experimental internal efficiency data for stage KD-2-2A are given in Fig.2. Where high supersonic speeds are used the blading losses increase and the stage efficiency is reduced. Fig.3 gives losses in nozzle blading TS-2A and the internal efficiency of stage KD-2-2A. Mean reaction curves for stage KD-2-2A are given in Fig.4. Internal efficiency curves for all six combinations investigated are given in Fig.5 and the results are discussed. Stage KD-2-2A was then tested with partial steam supply. Curves of the relative internal efficiency of the stage are given in Fig.6. Internal efficiency curves for the stage with different angles of steam delivery are given in Fig.7. It will be seen that the stage efficiency is much reduced with partial steam supply. This and other test results are discussed and are stated to be fully in accordance with theoretical expectations. The influence of nozzle diaphragm widths on stage efficiency of KD-2-1A was then investigated and

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the results are given in Fig.8. It is clearly shown that the stage efficiency falls off with a wide diaphragm and this is because the tests were made outside the zone of best width. The efficiencies of single- and two-row stages are then compared. The test results for two such stages are given in Fig.10 and show the conditions under which one or other of the two regulating stages should be selected. The number of unregulated stages and other constructional features of a machine vary considerably depending on the type of regulating stage used. A detailed analysis of this problem falls outside the scope of the present article. It is concluded that the single-row stages investigated are of high efficiency, particularly the stages KD-2-2A and KD-1-2A. If the gaps are right and the blading is correctly chosen a small negative reaction has little influence on the efficiency of a single row stage with short blades. On the basis of the tests it is considered that for the high and medium pressure cylinders of turbines the best two combinations are KD-2-2A and KD-1-2A composed of blade profiles TS-2A, TR-2A, TS-1A and TR-2A. Investigations on stage KD-2-2A with partial

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steam supply and various numbers of nozzles showed that the important effect of additional losses and secondary effects associated with partial steam supplies. Comparison of single- and two-row stages made of the new improved blade profiles shows that the difference between the possible highest efficiency of these stages has been reduced and the field of application of a velocity stage has been extended. There are 10 figures, 1 table and 2 Soviet references.

ASSOCIATION: Moskovskiy Energeticheskiy Institut (Moscow Power Institute)

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DEYCH, M.Ye., doktor tekhn.nauk, prof.; KAZINTSEV, F.V., inzh.; GOLOVIN, V.A., inzh.

Automatic computing device for solution of energy-loss equations used in the study of turbine bladings. Energomashinostroenie 5 no.3:31-34 Mr '59. (MIRA 12:3)

(Turbines)

SOV/96-59-6-2/22

AUTHORS: Deych, M.Ye., (Dr. Tech.Sci.), Kazintsev, F.V., Abramov, V.I., Kiselev, L.Ye. and Filippova, V.G. (Engineers)

TITLE: An Investigation of Turbine Stages with Long Blades of Constant Profile under Variable Conditions (Issledovaniye peremennogo rezhima turbinnykh stupenei s dlinnymi lopatkami postoyannogo profilya)

PERIODICAL: Teploenergetika, 1959, Nr 6, pp 8-17 (USSR)

ABSTRACT: This article describes the results of tests on four single-row stages with relatively long blades of constant profile, fitted to an experimental turbine. The efficiency of single-row stages depends on a number of geometrical and operating conditions: the configuration, pitch and angles of installation of the blades, the ratio of the flow areas, the velocity ratio and the Mach and Reynolds numbers. The tests described here were made to study the influence of these factors on the efficiency. The stages had a d/ℓ ratio + 7.73 which is the limiting value for cylindrical blading. The four stages investigated employed two types of guide vanes (TS-1A and TS-2A) and two types of working blades (TR-2A and TR-3A).

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An Investigation of Turbine Stages with Long Blades of Constant Profile under Variable Conditions

The principal geometrical characteristics of the blading are given in Table 1. All the stages used welded diaphragms of 400 mm mean diameter with guide vanes 48 mm high and working blades 51.7 mm high. The measuring equipment used is briefly described. The stages were tested with ratios of back pressure to inlet pressure of 0.9 to 0.54, which corresponds to a Mach number range of 0.4 to 1.0. The tests were made with constant back pressure. The influence of diaphragm leakage on the efficiency and the degree of reaction at root and tip sections were investigated. The quantity of leakage steam ranged from 0.8 to 3.5% of the flow through the guide vanes. The influence of the Reynolds number on the stage characteristics was investigated in three of the stages, with Reynolds numbers ranging from 3×10^5 to 7×10^5. The maximum error in determining the stage efficiency was between 0.4 and 0.6%. The influence of compressibility on the stage efficiency and degree of reaction is then considered. Stage efficiency graphs as functions of velocity and pressure ratios are given in

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Fig 1: it will be seen that for each stage there is a pressure ratio that gives maximum efficiency. Values of the best pressure ratio, the highest efficiency, and the change in efficiency as the pressure ratio deviates from the optimum value, are tabulated in Table 2. The curves in Fig 1 show that the efficiency is fairly stable as the velocity ratio changes, indicating that stages with guide vanes type TS-2A have a flatter characteristic as a function of the velocity ratio. This is because the ratio of the blade area to the guide-vane area is lower and there is consequently more reaction in stages with these guide vanes. Curves of stage efficiency as a function of M_0 with constant velocity ratio are given in Fig 2a, and curves of efficiency as function of the available heat drop with the speed constant in Fig 2b. From consideration of these curves it is concluded that the stage efficiency is reasonably stable. Curves of the pressure distribution over the pitch of the guide vanes at the tip and root sections respectively are given in Figs 3a and 3b. Corresponding curves under static

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